

NEW DESCRIPTION

A REVIEW OF THE WHITEFLY GENUS *DIALEUROLONGA* DOZIER
(HEMIPTERA: ALEYRODIDAE) WITH DESCRIPTION OF A NEW SPECIES FROM INDIAR. PUSHPA^{1,2} AND R. SUNDARARAJ^{1,3}¹Wood Biodegradation Division, Institute of Wood Science & Technology, 18th Cross, Malleswaram, Bengaluru 560 003, Karnataka, India.²Email: pushpa2000@in.com³Email: rsundararaj@icfre.org

The whitefly genus *Dialeurolonga* Dozier is represented in India by nine species. In this paper, *Dialeurolonga connari* sp. nov. infesting *Connarus sclerocarpus* from Kattapana (Kerala: India) is described and illustrated. Further, intra-specific variation observed in *D. malleshwaramensis* has been reported. A key to the Indian species of *Dialeurolonga* is given.

Keywords: Taxonomy, Aleyrodidae, *Dialeurolonga*, whitefly, new species, India

INTRODUCTION

Dialeurolonga Dozier is a whitefly genus with 53 hitherto described species (Martin and Mound 2007), majority of them known from Ethiopian and Malaysian regions; a few including the type species have been described from the Oriental region (Martin 1999). In India, *Dialeurolonga* is so far represented by nine species, namely *D. elongata* (Dozier), *D. lagerstroemiae* Jesudasan & David, *D. maculata* (Singh), *D. malleshwaramensis* Sundararaj, *D. davidi* Dubey & Sundararaj, *D. kumargiriensis* Dubey & Sundararaj, *D. multituberculata* Dubey & Sundararaj, *D. multipori* Dubey & Sundararaj, *D. pseudocephalidistincta* (Dubey and Sundararaj 2006). In this paper, a new species *D. connari* infesting *Connarus sclerocarpus* in southern India is described and illustrated raising the total number of Indian species of *Dialeurolonga* to ten. A key to the Indian species of the genus is given.

KEY TO THE INDIAN SPECIES OF *Dialeurolonga*

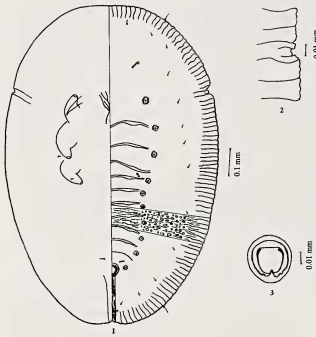
1. Submargin without a row of conical papillae; median pore cephalad of vasiform orifice absent 2
- Submargin with a row of conical papillae; cephalad of vasiform orifice a large median pore with a chitinised rim evident
..... *elongata* (Dozier)
2. Laterad of vasiform orifice without enlarged kidney-shaped patches 3
- Laterad of vasiform orifice with enlarged kidney-shaped patches *davidi* Dubey & Sundararaj
3. Dorsum without tubercles or papillae 4
- Dorsum with tubercles or papillae 5
4. Subdorsum with a row of 8 pairs of curved minute setae; thoracic and caudal tracheal pores invaginated

- *kumargiriensis* Dubey & Sundararaj
- Subdorsum without a row of setae; thoracic and caudal tracheal pores indicated by six minute teeth *maculata* (Singh)
5. Subdorsal setae absent 6
- Subdorsal setae present 7
6. Thoracic and abdominal segments without submedian tubercles, but with spherical structure
..... *lagerstroemiae* Jesudasan & David
- Dorsum completely tuberculate; submedian tubercles present, but without spherical structure
..... *multituberculata* Dubey & Sundararaj
7. Puparium with enlarged submedian tubercles 8
- Puparium without enlarged submedian tubercles 9
8. Three to five pairs of enlarged submedian tubercles; subdorsum with 9-12 pairs of capitate setae
..... *malleshwaramensis* Sundararaj
- A row of enlarged submedian tubercles extending from laterad of vasiform orifice to prothorax; subdorsum with 13 pairs of minute pointed setae *connari* sp. nov.
9. Margin smoothly crenulate; subdorsal setae capitate, less than 18 µm long; cephalothorax not separated by subdorsal furrow
..... *multipori* Dubey & Sundararaj
- Margin irregularly crenulate; subdorsal setae with blunt end, 18-35.5 µm long; cephalothorax separated by a faint subdorsal furrow *pseudocephalidistincta* Dubey & Sundararaj

1. *Dialeurolonga connari* sp. nov.

(Figs 1-3)

Puparium: White, without secretion of wax; elliptical, broadest across prothoracic segment region, slightly indented at the thoracic tracheal pores; found in groups on the under surface of leaves; 1.18-1.24 mm long, 0.84-0.86 mm wide. Margin irregularly crenulate. Thoracic and caudal tracheal



Figs 1-3: *Dialeurolonga connari* sp. nov.

1. Puparium, 2. Margin at thoracic tracheal pore region, 3. Vasiform orifice

pores indicated. Anterior and posterior marginal setae, 8 μ m and 10 μ m long respectively.

Dorsum: Submargin with regularly arranged striations radiating from margin towards subsorsum; subsorsum with dense microtubercles; a submedian row of tubercles extending from laterad of vasiform orifice to prothorax; median area with transverse broken ridges, submedian pockets well-developed on all segment sutures. Longitudinal moulting suture reaching margin and transverse moulting suture reaching submedian area. Thoracic tracheal furrows indicated and caudal tracheal furrow sculptured, 164-172 μ m long, 4-6 μ m wide at its broadest end.

Chaetotaxy: Four pairs of capitate setae-cephalic setae 14 μ m long, first abdominal setae 8 μ m long, eighth abdominal setae cephalolaterad of vasiform orifice 6 μ m long and caudal setae 8 μ m long on caudal ridge. Subsorsum with 13 pairs of pointed setae 2.5 μ m long.

Vasiform orifice: Subcircular, longer than wide (42.5-52.5 μ m long, 43-45 μ m wide), postero-lateral wall toothed with distinct tooth in the centre; operculum subcordate, 30-32.5 μ m long, 27.5-30 μ m wide. Lingula slightly exposed.

Venter: A pair of ventral abdominal setae 14 μ m long, 44 μ m apart. Antennae reaching base of prothoracic legs. Thoracic and caudal tracheal folds indicated without markings. A pair of setae at the base of meso- and metathoracic legs present.

Host: *Connarus sclerocarpus*.

Type Locality: Kattapana, Kerala, India.

Material examined: Holotype: One puparium, mounted on slide from *Connarus sclerocarpus*. Coll. R. Pushpa, 27.iii.2007, deposited in the collection of Forest Entomology Division, Forest Research Institute, Dehradun.

Paratypes: Nine mounted puparia, data same as holotype, deposited one each in the collections of Division of Entomology, Indian Agricultural Research Institute, New Delhi; Zoological Survey of India, Kolkata, and the remaining in the collection of Institute of Wood Science & Technology, Bengaluru.

Discussion: This species can be readily recognized from other known species of *Dialeurolonga* in shape: submargin with striations, subsorsum tuberculated, a row of 13 pairs of subsorsal setae and by the absence of stipples in thoracic and caudal tracheal folds.

Etymology: Named after the genus of its known host plant, *Connarus*.

2. *Dialeurolonga davidi* Dubey & Sundararaj

Dialeurolonga davidi Dubey & Sundararaj 2006.

Oriental Ins. 40: 160.

Material examined: Holotype: puparium, INDIA: Karnataka: Kudremukh National Park, on unidentified plant, 10.viii.2001. Coll. A.K. Dubey.

Host: Unidentified plant (Dubey and Sundararaj 2006).

Distribution: INDIA: Karnataka (Dubey and Sundararaj 2006).

Discussion: This species is distinct from all known species of *Dialeurolonga* in having kidney-shaped patches laterad of vasiform orifice.

3. *Dialeurolonga elongata* Dozier

Dialeurodes (Dialeurolonga) elongata Dozier 1928.

J. Agric. Res. 36: 1001-1005. *Dialeurodes elongata* Singh 1931. *Mem. Dep. Agric. India* 12 (1): 36.

Dialeurolonga elongata Takahashi 1951. *Mem. Inst. Sci. Madagascar* 6A: 345.

Jesudasan & David 1991. *Oriental Ins.* 25: 308-309.

Material examined: INDIA: Karnataka: Kudremukh National Park, 10 puparia, on *Tabernaemontana heyneana*, 8.viii.2001. Coll. A.K. Dubey.

Hosts: *Citrus* sp., *Ixora coccinea*, *I. pavetta*, *Litchi chinensis* (Singh, 1931); *Murraya exotica* (David & Subramaniam, 1976); *Tabernaemontana heyneana* (Dubey & Sundararaj, 2006).

Distribution: INDIA: Bihar: Pusa (Singh 1931); Tamil Nadu: Chennai (David and Subramaniam 1976); Karnataka: Kudremukh National Park (Dubey and Sundararaj 2006).

Discussion: This species is defined by its typical elongate shape, margin with wax tubes and dorsum uniformly pitted all over with a few papillae.

4. *Dialeurolonga kumargiriensis* Dubey & Sundararaj

Dialeurolonga kumargiriensis Dubey & Sundararaj, 2006. *Oriental Ins.* 40: 161.

Material examined: **Holotype:** puparium, INDIA: Karnataka: Kumargiri, on *Ficus nervosa*, 1.ix.2001. Coll. A.K. Dubey.

Host: *Ficus nervosa* (Dubey & Sundararaj, 2006).

Distribution: INDIA: Karnataka (Dubey and Sundararaj 2006).

Discussion: This species is rather distinct from the other known species of *Dialeurolonga* in the absence of subdorsal papillae or tubercles, presence of curved setae on subdorsum and invaginated thoracic and caudal tracheal pores.

5. *Dialeurolonga lagerstroemiae* Jesudasan & David

Dialeurolonga lagerstroemiae Jesudasan & David 1991. *Oriental Ins.* 26: 309-310.

Material examined: **Holotype:** puparium, INDIA: Uttar Pradesh (=Uttarakhand): Dehradun, on *Lagerstroemia speciosa*, 11.ii.1985. Coll. R.W.A. Jesudasan.

Host: *Lagerstroemia speciosa* (Jesudasan & David, 1991).

Distribution: INDIA: Uttar Pradesh (=Uttarakhand) (Jesudasan and David 1991).

Discussion: The puparium of this species can be recognized by its shorter seventh abdominal segment and presence of submedian granules on each of the abdominal segments.

6. *Dialeurolonga maculata* (Singh)

Aleurotulus maculata Singh 1931. *Mem. Dep. Agric. India* 12: 89.

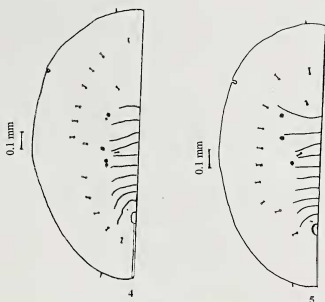
Dialeurolonga maculata David & Jesudasan 1989. *Entomon* 14: 371.

Material examined: INDIA: Tamil Nadu: Chennai, 1 puparium, on *Ficus religiosa*, 3.vii.1971. Coll. B.V. David.

Host: *Ficus religiosa* (Singh, 1931).

Distribution: INDIA: Bihar: Pusa (Singh 1931); Tamil Nadu: Chennai (Jesudasan and David 1991).

Discussion: This species is defined by its submargin with faint and irregular radial striations, vasiform orifice subcordate, operculum subrectangular with the corners rounded and caudal margin hairy, filling three-fourths of the orifice, lingua cylindrical with a swollen and setose tip projecting short distance beyond the caudal ridge and a narrow dotted groove run: from the end of the orifice to the caudal margin.



Figs 4-5: *Dialeurolonga malleshwaramensis* Sundararaj (Dorsal surface)

4. Puparium from upper surface, 5. Puparium from under surface

7. *Dialeurolonga malleshwaramensis* Sundararaj

(Figs 4-5)

Dialeurolonga malleshwaramensis Sundararaj 2001. *Entomon* 26(2): 191-194.

Sundararaj (2001) described this species and Dubey & Ko (2006) redescribed it.

Material examined: INDIA: Karnataka: Bangalore, **Paratype:** puparium, on *Polyalthia longifolia*, 7.vii.1999. Coll. R. Sundararaj; Bengaluru, 14 puparia, on *Polyalthia longifolia*, 25.v.2007. Coll. R. Pushpa.

Host: *Polyalthia longifolia* (Sundararaj, 2001).

Distribution: INDIA: Karnataka (Sundararaj 2001).

Comments: Intraspecific variation has been observed in *D. malleshwaramensis* Sundararaj. The puparia, collected from upper surface of leaves, have more number of capitate setae and submedian tubercles (Fig. 4), while the puparia, on under surface of leaves have less number of capitate setae and submedian tubercles (Fig. 5).

Discussion: The puparium of this species is characterised by the presence of 4 pairs of blunt capitate setae, 3-5 pairs of enlarged submedian tubercles and subdorsum with 9-12 pairs of capitate setae.

8. *Dialeurolonga multipori* Dubey & Sundararaj

Dialeurolonga multipori Dubey & Sundararaj, 2006. *Oriental Ins.* 40: 162.

Material examined: **Holotype:** puparium, INDIA: Karnataka: Yellapur, on *Casearia esculenta*, 11.x.2001. Coll. A.K. Dubey.

Host: *Casearia esculenta* (Dubey & Sundararaj, 2006).

Distribution: INDIA: Karnataka (Dubey and Sundararaj 2006).

Discussion: This species can be easily separated from other known Indian species in having more number of subdorsal setae and their irregular arrangement and absence of tubercles on cephalothorax and abdomen, tassellation, vasiform orifice not notched at caudal end and excluded lingula.

9. *Dialeurolonga multituberculata* Dubey & Sundararaj

Dialeurolonga multituberculata Dubey & Sundararaj, 2006. *Oriental Ins.* 40: 163.

Material examined: **Holotype:** puparium, INDIA: Karnataka: Yellapur, on *Careya arborea*, 11.x.2001. Coll. A.K. Dubey.

Host: *Careya arborea* (Dubey & Sundararaj, 2006).

Distribution: INDIA: Karnataka (Dubey and Sundararaj 2006).

Discussion: The puparium of this species is readily recognizable by the presence of tubercles on whole of dorsum, notched vasiform orifice and distinct thoracic and caudal

tracheal furrows.

10. *Dialeurolonga pseudocephalidistincta*

Dubey & Sundararaj

Dialeurolonga pseudocephalidistincta Dubey & Sundararaj, 2006. *Oriental Ins.* 40: 164.

Material examined: **Holotype:** puparium, INDIA: Karnataka: Kudremukh National Park, on unidentified plant, 10.viii.2001. Coll. A.K. Dubey.

Host: Unidentified plant (Dubey and Sundararaj 2006).

Distribution: INDIA: Karnataka (Dubey and Sundararaj 2006).

Discussion: This species is rather distinct from the other species of *Dialeurolonga* in having cephalothoracic fold on subdorsum and striations on lingula.

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